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E65 Speech Processing System

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E65 Speech Processing System (SVS)

Model: E65/E66

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Recognize the system that can be controlled using SVS
- Understand how SVS operates on the MOST-Bus

Introduction

The Speech Processing System (SVS) of the E65 is an evolution of the SES system familiar from the E38. If compared to the E38 speech processing system (up to 40 commands) the customer can now choose from 400 possible commands.

The SVS is used in the MOST network as a means of control and communication between the user and the entire system. It offers improvements in operability of the vehicle and increases driver comfort. The safety-related functions of the vehicle are not voice controlled.

The voice input is always in addition to buttons or Control Display functions. The Speech Processing System is standard equipment and works in association with the telephone.

The microphone of the hands-free telephone equipment is used as the input device for SVS.

The SVS will initially be available in three languages: German, U.S. English and U.K. English. Other languages may follow in subsequent years. There are currently hardware differences between language versions.

The Speech Processing System controls the following systems:

- Telephone
- Navigation
- Radio
- Audio CD Player
- CD Changer
- Cassette Player (if installed)
- Climate Control (planned)
- Internet Browser (planned)
- Telematics (planned)
- On-Board Computer
- Note Pad (recorder)

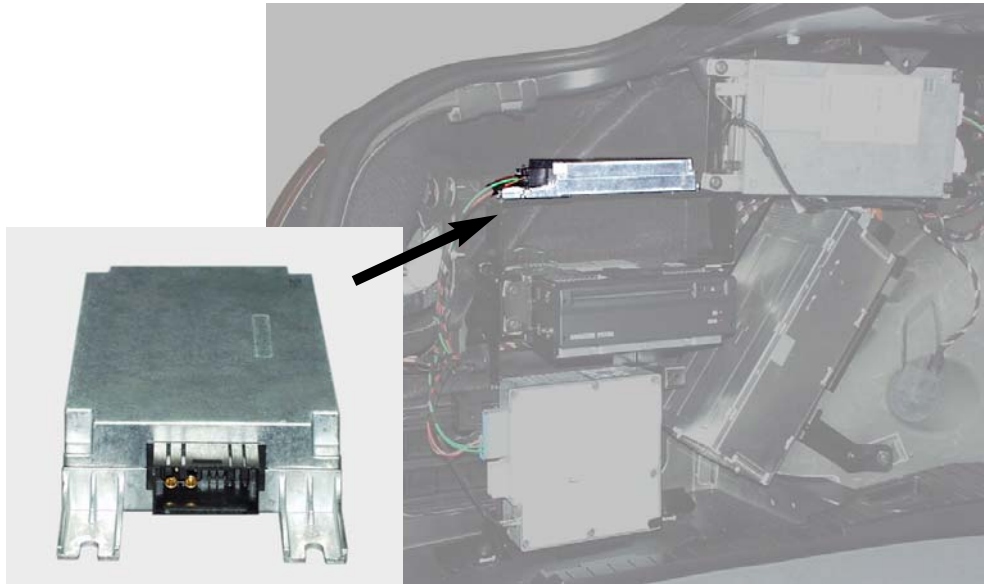


Components

Speech Processing System Control Unit

The SVS control unit is part of the MOST network. It is a slave component that has no network management responsibilities. The SVS control unit is responsible for recognizing the customer's speech and processing it into a command that is sent out over the MOST.

The SVS control unit is located in the left rear corner of the luggage compartment.



The SVS control unit has one 12 pin ELO connector that supplies KL 30, KL 31 and the two MOST connections.

The remainder of the components needed for the operation of the system are:

- Push-to-talk switch (part of MFL/SZL)
- Microphone (hardwired to telephone control unit)
- Audio output (generated by ASK)
- Instrument cluster for visual display of selected menus and functions.

The SVS control unit is diagnosable by the Diagnostic Program via the MOST network.

Principle of Operation

The Voice Processing System is a self-learning system. Each command has been learned from approximately 100 people with different dialects. Even extreme dialects are covered and a high recognition capability is achieved.

It is important that people speak as naturally as possible. They should not speak too loud or whisper.



Operation

Start and Cancel, Push-To-Talk Button (PTT)

The system is started using the Push-To-Talk button on the multi-function steering wheel.

In SVS mode, the Control Display requests a change in status. The Control Display requests two audio channels from the Audio System Controller (ASK). One channel comes from the microphone to the SVS and the other channel from the SVS to the front door-mounted loudspeakers, left and right.

The SVS transmits the change in status to the Control Display. There is a chime generated by the ASK to confirm that the SVS system has been initialized, the recognition dialog begins (system waits for command).

By pressing the PTT button again, the dialog can be ended. The dialog can also be ended at any time by voice, using the "Cancel" command.

Shut-off

While the dialog is active, the Control Display (as system master) can interrupt it (e.g. for a priority audio output). In this case, the Control Display sends the status request "interrupt" to the SVS. There can then be no output on the audio channel.

The Control Display informs the SVS as soon as the recognition dialog can resume.

General Commands

General commands are part of all function menus and can always be recognized by the SVS.

The following commands are valid for all function menus:

- “Cancel” - The current function is terminated.
- “Main menu” - You can access the main menu at any time with this command.
- “Help” - This command activates the help mode. The Help mode explains how to operate the command.
- “Options” - This command issues a list of all possible commands in the menu.

Full Mode

Detailed output commands and long forms for voice commands are the features of the Full Mode dialog. Full Mode is used to support inexperienced users and help them to perform the input required, e.g. "I'd like to Dial a number," or "I would like to listen to KLOS."

After a number of successful actions, the system invites the operator to switch to Quick Mode.

Quick Mode

The Quick Mode features commands in short format. The purpose of the Quick Mode is to shorten the needed dialog for experienced users. e.g. " Dial number," " Play CD." etc.

When the SVS operates in Quick Mode, if a command is rejected twice or if a Help function is needed, the SVS automatically switches back to Full Mode.

Visual Feedback

The E65 includes a visual feedback in the form of a text output on the display.

The SVS status message is displayed in the top line of the area below the tachometer, 20 characters are available. 18 characters are used in the lower line of the display to indicate the user input.



Functions

Telephone

The following functions are available for voice control of the telephone:

- “PIN input” - The user can enter the PIN number of the telephone card by voice.
- “Switch telephone on” - The telephone can be activated by voice.
- “Dial number” - The user can enter any telephone number by voice. If the number is completely detected, the dial-up process is started by voice command.
- “Store names” (internal to the SVS) - The user can associate names and telephone numbers by a dialog and enter them into the phone book in the SVS. The entries are made in sequence. The overall memory capacity is 100 names. When you store names by voice, make sure that a sample comparison is made with the names already stored in the phone book.
- “Select names” - The names stored in the SVS internal phone book can be addressed by voice. The corresponding phone number is then transmitted to the phone and the connection is established.
- “Dial repeat” - This function repeats the last number dialed.
- “Display list of SMS / E-mails” (planned) - This function displays a list of all SMS (Short Message Service) received by the telephone on the Control Display.
- “Read phone book” (SVS internal) - The phone book inside the SVS is read sequentially. You can jump back and forth in the phone book by voice commands. The user can use a voice command to select the entry which has just been read from the phone book. Then the telephone connection is established.
- “Delete a phone book entry” (SVS internal) - The user can delete a single entry from the phone book. By voice, the user must enter the name corresponding to the entry to be deleted. For security reasons, the user must confirm it before the entry is really deleted.
- “Delete a phone book” (SVS internal) - The user can delete all entries in the directory. For security reasons, the user must confirm it before the entry is actually deleted.

Navigation

The following functions are available for voice control of the navigation system:

- “Store destination” (SVS internal address list) - The user can associate names and destinations by voice and enter them into the phone book inside the SVS. The entries are placed in sequence. The overall memory capacity is 50 names. When you store names entered by voice, make sure that a sample comparison is made with the names already stored in the directory.
- “Select destination” (SVS internal address book) - The names stored in the SVS internal address book can be addressed by voice. The destination corresponding to the name is then transmitted by voice command to the navigation system and the route guidance starts.
- “Destination input” - The destination input menu of the navigation system is activated.
- “Destination Home” - The navigation system takes the home address as the destination address and starts the route guidance.
- Route guidance on/off - Controls route guidance display
- “Information on/off”
- “Map”
- “Set scale” - With this function, you can change the scale of the map. The user can define the scale directly by entering scale parameters (500ft, 1 mile, 10 miles, 50 miles etc.). He/she can also enlarge or reduce the scale step by step with voice commands.
- “Store position”
- “Display Point of interest” (POI) - By voice input, the following POIs can be displayed: Hotels / Service stations / Parking at location / Destination.
- “Display new route”
- “Display last destinations”
- “Select highway route”
- “Select country route”
- “Select fastest route”

Radio

The following functions are available for voice control of the radio system:

- “Radio on / off”
- “Radio auto-store”
- “Select AM/FM”
- “Select frequency”
- “Radio station forward/back”

Audio

The following functions are available for voice control of the audio system:

- Audio off

CD Changer/CD Player

The following functions are available for voice control of the CD changer:

- “Select track”

Cassette Player

The following functions are available for voice control of the cassette deck:

- “Cassette on / off”
- “Change side”

On-Board Computer

The following functions are available for voice control of the On-Board Computer:

- “Show board computer”

Note Pad (SVS-Internal)

The note pad allows recording of voice messages. These are the functions available:

- “Record messages” - You can record several messages. They are stored in sequence. The single messages are separated by a separator word or a signal. Overall, you have 5 minutes available to record messages. 10 s before the memory is full, a visual warning is output on the instrument cluster display. Recording stops if you press the PTT button or after the system detecting a long pause.
- “Read messages” - You can listen to complete Message block or to individual messages. Use the function "forward" or "back" to skip between messages. Between the single messages, a signal or separator word is output.
- “Delete message” - You can delete the complete Message block or individual messages. In particular, you can delete the message you just listened to. For security reasons, the user must confirm before the message is actually deleted.



Classroom Exercise - Review Questions

1. How is an SVS command initiated?

2. What systems of the E65 have possible voice control?

3. Describe the communication between control units that needs to occur to successfully complete a dialog between SVS and the user. Use the system overview schematic for help.
